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Proteases Produced by Mammalian Lung Tissue.

The aim of this project is the characterization of a low molecular weight protease produced by human embryonic lung cells in vitro. This protease is a potent activator of serum proenzymes and may be involved in certain pathological conditions of the human lung, namely respiratory distress syndrome (RDS) and chronic emphysema. The proteases from human and mouse lung cells grown in culture will be purified and characterized as to their physical properties, mode of action, substrate specificity, and ability to activate proenzymes such as plasminogen procollagenase and proelastase. Antibodies will be made to the purified proteins. These antibodies will be used to determine at what stage in the embryonic development of the mammalian lung this enzyme appears and if it continues to be produced after parturition. Fluorescein-labeled antibody will be employed as an immunofluorescent probe to test if other cells in preparations of fixed lung tissue are producing this enzyme. Finally, experiments will be designed to ascertain whether the production of the lung enzyme can be influenced by drugs such as corticosteroids.

It is hoped that this analysis will provide information necessary to determine if this protease may be involved in the respiratory disease and, if so, how one may develop therapeutic approaches to these conditions.

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